

February 24, 2015



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2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

February 24, 2015

Mr. Scot Fitzgerald
CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Re: CHPRC SAF S15-001
Work Order: 365929
SDG: GEL365929

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 28, 2015. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

Heather Shaffer
Project Manager

Purchase Order: 300071
Chain of Custody: S15-001-118, S15-001-119, S15-001-342, S15-001-346, S15-001-347, S15-001-351 and S15-001-353
Enclosures



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Case Narrative

February 24, 2015

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S15-001
SDG: GEL365929

February 24, 2015

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on January 28, 2015, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative and DER

Sample Identification

The laboratory received the following samples:

<u>Laboratory Identification</u>	<u>Sample Description</u>
365929001	B2YYW7
365929002	B2YYW9
365929003	B303L5
365929004	B303L4
365929005	B303L7
365929006	B300F9
365929007	B303L6
365929008	B300F8
365929009	B303X3
365929010	B301B6
365929011	B303X5
365929012	B30116

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

February 24, 2015

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: General Chemistry and Metals.

This package, to the best of my knowledge, is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.



Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

February 24, 2015

50165

CH2M Hill Plateau Remediation Company				C.O.C. # S15-001-119			
365929				Page 1 of 1			
Collector K.C. Patterson CHPRC				Telephone No. 509-376-4650			
SAF No. S15-001				Purchase Order/Charge Code 300071			
Project Title SURV, JANUARY 2015				Ice Chest No. 6005-428			
Shipped To (Lab) GEL Laboratories, LLC				Bill of Lading/Air Bill No. 1772730005020			
Protocol SURV				Offsite Property No. 5366			
POSSIBLE SAMPLE HAZARDS/REMARKS *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1				SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Sample No. B2YYW7	Filter *	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
	N	W JAN 27 2015	1246	1x250-mL GIP	9056_ANIONS_IC: COMMON	28 Days/48 Hours	Cool <=6C

Relinquished By K.C. Patterson CHPRC	Print	Sign	Date/Time	Received By M.A. White/CHPRC	Print	Sign	Date/Time
			JAN 27 2015 1200				JAN 27 2015 1235
Relinquished By M.A. White/CHPRC	Print	Sign	Date/Time	Received By FEDEX	Print	Sign	Date/Time
			JAN 27 2015 1400				
Relinquished By FedEx	Print	Sign	Date/Time	Received By Sarah Edwards	Print	Sign	Date/Time
			1.28.15				1.28.15/0845
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By Date/Time			

A-6004-842 (REV 2)

PRINTED O 11/25/2014

February 24, 2015

CH2MHill Plateau Remediation Company				C.O.C. # S15-001-118			
K.C. Patterson CHPRC				Page 1 of 1			
Collector				Telephone No. 509-376-4650			
SAF No. S15-001				Purchase Order/Charge Code 300071			
Project Title SURV, JANUARY 2015				Ice Chest No. 605-428			
Shipped To (Lab) GEL Laboratories, LLC				Bill of Lading/Air Bill No. 712730205020			
Protocol SURV				Offsite Property No. 5366			
POSSIBLE SAMPLE HAZARDS/REMARKS ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1				SPECIAL INSTRUCTIONS Hold Time Priority: 30 Days PRIORITY			
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>							
Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2YYW9	Y	W JAN 27 2015	246	1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C

Relinquished By K.C. Patterson CHPRC	Print 	Sign	Date/Time JAN 27 2015 1250	Received By M.A. White/CHPRC	Print 	Sign	Date/Time JAN 27 2015 1250	Matrix *
Relinquished By K.C. Patterson CHPRC	Print 	Sign	Date/Time JAN 27 2015 1400	Received By FEDEX	Print 	Sign	Date/Time JAN 27 2015 1250	S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By K.C. Patterson CHPRC	Print 	Sign	Date/Time JAN 27 2015 1400	Received By Fed Ex	Print 	Sign	Date/Time 1.28.15/0845	
Relinquished By K.C. Patterson CHPRC	Print 	Sign	Date/Time JAN 27 2015 1400	Received By Fed Ex	Print 	Sign	Date/Time 1.28.15/0845	
Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By				Date/Time
FINAL SAMPLE DISPOSITION								Date/Time

February 24, 2015

CH2MHill Plateau Remediation Company				C.O.C. # S15-001-342			
K.C. Patterson CHPRC				Page 1 of 1			
Collector		K.C. Patterson CHPRC		Telephone No.		509-376-4650	
SAF No.		S15-001		Purchase Order/Charge Code		300071	
Project Title		SURV, JANUARY 2015		Ice Chest No.		605-428	
Shipped To (Lab)		GEL Laboratories, LLC		Bill of Lading/Air Bill No.		17727 30205020	
Protocol		SURV		Offsite Property No.		5366	
POSSIBLE SAMPLE HAZARDS/REMARKS *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1				SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time
B303L5	N	W	JAN 27 2015	1117	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months
B303L4	Y	W	JAN 27 2015	↓	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
K.C. Patterson CHPRC			JAN 27 2015 1250	M.A. White/CHPRC			JAN 27 2015 1250
Relinquished By			Date/Time	Received By			Date/Time
M.A. White/CHPRC			JAN 27 2015 1400	FEDEX			
Relinquished By			Date/Time	Received By			Date/Time
9 of 10			1.28.15	Sarah Edwards			1.28.15/0845
Relinquished By			Date/Time	Received By			Date/Time
10 of 10			1.28.15	Sarah Edwards			1.28.15/0845
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By Date/Time			

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # S15-001-346	
		365929				Page 1 of 1	
Collector	D.J. Woehle/CHPRC	Contact/Requester	Karen Waters-Husted		Telephone No.	509-376-4650	
SAF No.	S15-001	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071	
Project Title	SURV, JANUARY 2015	Logbook No.	HNF-N-50669 / 178		Ice Chest No.	6WS-538 428 1/27/15	
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	17727 30205020	
Protocol	SURV	Priority:	30 Days	PRIORITY	Offsite Property No.	5366	
POSSIBLE SAMPLE HAZARDS/REMARKS				SPECIAL INSTRUCTIONS			
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1				Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time
B303L7	Y		JAN 26 2015	1159	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months
B300F9	N		JAN 26 2015	1159	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months
							Preservative HNO3 to pH <2 HNO3 to pH <2

February 24, 2015

Relinquished By D.J. Woehle/CHPRC	Print <i>[Signature]</i>	Sign	Date/Time JAN 26 2015 1330	Received By SSU-1	Print SSU-1	Sign	Date/Time JAN 26 2015 1330	Matrix *
Relinquished By	SSU-1		Date/Time JAN 27 2015 1140	Received By L.D. Wall CHPRC	<i>[Signature]</i>		Date/Time JAN 27 2015 1140	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By L.D. Wall CHPRC	<i>[Signature]</i>		Date/Time JAN 27 2015 1400	Received By FEDEX	FEDEX		Date/Time	
Relinquished By FEDEX	<i>[Signature]</i>		Date/Time 1.28.15/0845	Received By Sarah Edwards	<i>[Signature]</i>		Date/Time 1.28.15/0845	
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)				
PRINTED O 12/9/2014				A-6004-842 (REV 2)				

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CH2MHill Plateau Remediation Company				C.O.C. # S15-001-347			
305929				Page 1 of 1			
Collector D.J. Woshle/CHPRC		Contact/Requester Karen Waters-Husted		Telephone No. 509-376-4650			
SAF No. S15-001		Sampling Origin Hanford Site		Purchase Order/Charge Code 300071			
Project Title SURV, JANUARY 2015		Logbook No. HNF-N-506 69 / 78		Ice Chest No. 605-5385 428			
Shipped To (Lab) GEL Laboratories, LLC		Method of Shipment Commercial Carrier		Bill of Lading/Air Bill No. 772730205020			
Protocol SURV		Priority: 30 Days		Offsite Property No. 5366			
POSSIBLE SAMPLE HAZARDS/REMARKS ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1				SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time
B303L6	Y	W	1-26-15	0930	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months
B300F8	N	W	1-26-15	0930	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months
							Preservative HNO3 to pH <2 HNO3 to pH <2

Relinquished By D.J. Woshle/CHPRC	Print	Sign	Date/Time JAN 26 2015 1330	Received By SSU #1	Print	Sign	Date/Time JAN 26 2015 1330
Relinquished By SSU-1			Date/Time JAN 27 2015 1140	Received By L.D. Wall CHPRC			Date/Time JAN 27 2015 1140
Relinquished By L.D. Wall CHPRC			Date/Time JAN 27 2015 1400	Received By FedEx			Date/Time
Relinquished By FedEx			Date/Time 1.28.15 / 0845	Received By Sarah Edwards			Date/Time 1.28.15 / 0845
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)			
PRINTED O 12/9/2014				A-6004-842 (REV 2)			

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CH2MHill Plateau Remediation Company				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # S15-001-351	
				Page 1 of 1					
Collector	S.W. King/CHPRC			Contact/Requester	Karen Waters-Husted			Telephone No.	509-376-4650
SAF No.	S15-001			Sampling Origin	Hanford Site			Purchase Order/Charge Code	300071
Project Title	SURV, JANUARY 2015			Logbook No.	HNF-N-506 71154			Ice Chest No.	605-5388 428
Shipped To (Lab)	GEL Laboratories, LLC			Method of Shipment	Commercial Carrier			Bill of Lading/Air Bill No.	772730205020
Protocol	SURV			Priority:	30 Days			Offsite Property No.	5366
POSSIBLE SAMPLE HAZARDS/REMARKS				SPECIAL INSTRUCTIONS				Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1									
Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis		Holding Time	Preservative
B303X3	N	W	JAN 27 2015	0835	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04		6 Months	HNO3 to pH <2
B301B6	Y	W	✓	✓	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04		6 Months	HNO3 to pH <2

Relinquished By S.W. King/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time JAN 27 2015 1300	Received By L.D. Wall CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time JAN 27 2015 1300	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By L.D. Wall CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time JAN 27 2015 1400	Received By FedEx	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time JAN 27 2015 1400	
Relinquished By FedEx	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 1.28.15/0815	Received By Sarah Edwards	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 1.28.15/0845	
Relinquished By	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time	Received By	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time	
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Date/Time
PRINTED O 12/9/2014				A-6004-842 (REV 2)				

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CH2M Hill Plateau Remediation Company		C.O.C. # S15-001-353	
305929		Page 1 of 1	
Collector	S.W. King/CHPRC	Contact/Requester	Karen Waters-Husted
SAF No.	S15-001	Sampling Origin	Hanford Site
Project Title	SURV, JANUARY 2015	Logbook No.	HNF-N-506 71, 54
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier
Protocol	SURV	Priority:	30 Days
POSSIBLE SAMPLE HAZARDS/REMARKS *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1		SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Telephone No.	509-376-4650	Purchase Order/Charge Code	300071
Ice Chest No.	605-538 428	Bill of Lading/Air Bill No.	7727 30205020
Offsite Property No.	5366		

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B303X5	Y		W JAN 27 2015	1040	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B30116	N		W JAN 27 2015	1040	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2

Relinquished By	S.W. King/CHPRC	Print	Sign	Received By	L.D. Wall	CHPRC	Date/Time	JAN 27 2015	1300	Date/Time	JAN 27 2015	1300	Matrix *
Relinquished By	L.D. Wall	CHPRC		Received By	FEDEX		Date/Time			Date/Time			DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By	FEDEX			Received By	Sarah Edwards		Date/Time	1.28.15/0845		Date/Time	1.28.15/0845		
Relinquished By				Received By			Date/Time			Date/Time			

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time
PRINTED O 12/9/2014			

A-6004-842 (REV 2)

February 24, 2015



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>305929</u>	
Received By: <u>8E</u>		Date Received: <u>1.28.15</u>	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0cpm</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>130532792</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>7727 3020 5020</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HS Date 1/28/15 Page 1 of 1

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Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
U	Programmed	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.	Y			Includes MDA, TPU, count uncert.
J	Programmed	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Y	Organics		Organics only
P	Programmed	Aroclor target analyte with greater than 25% difference between column analyses.	Y	Organics		PCB only
C	Manual	Analyte has been confirmed by GC/MS analysis	Y	Organics	Pesticide	IF GC/MS confirmation was attempted but unsuccessful do not qualify with C
B	Programmed	The analyte was detected in both the associated QC blank and in the sample.	Y	Organics		
E	Manual	Concentration exceeds the calibration range of the instrument	Y	Organics		Qualifier Uploaded
A	Manual	The TIC is a suspected aldol-condensation product	Y	Organics	Semi-Volatile	Uploaded with TIC
X	Programmed	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			Replaces H Hold Date In RAD replaces UI. Same usage as standard X as well.
N	Programmed	Spike Sample recovery is outside control limits.	Y			
*	Programmed	Duplicate analysis not within control limits	Y	Inorganics		
>	Programmed	Result greater than quantifiable range or greater than upper limit of the analysis range	Y	General Chemistry		
Z	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
B	Programmed	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Y	Inorganics	Metals	Replaces J Estimated Value
D	Programmed	Results are reported from a diluted aliquot of sample.	Y			Dilution
E	Programmed	Reported value is estimated due to interferences. See comment in narrative.	Y	Inorganics	Metals	GEL E
M	Manual	Duplicate precision not met.	Y	Inorganics	Metals	Replaces *
o	Programmed	Analyte failed to recover within LCS limits (Organics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely preformed
T	Programmed	Spike and/or spike duplicate sample recovery is outside control limits.	Y	Organics		GC/MS only
W	Manual	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Y	Inorganics		No GFAA in house.
B	Programmed	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample	Y	Radiological		
Y	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
+	Manual	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Y	Inorganics		
B	Programmed	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Y	General Chemistry		Replaces J Estimated Value
C	Programmed	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Y	Inorganics	Metals	Replaces B Blank Detection
C	Programmed	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Y	General Chemistry		Replaces B Blank Detection
<	Programmed	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	Y	General Chemistry		for Reactive CN/S

February 24, 2015

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
UX	Manual	Gamma Spectroscopy--Uncertain identification	Y	Radiological		

Laboratory Certifications

List of current GEL Certifications as of 24 February 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122014-16
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12

Metals Analysis

Case Narrative

February 24, 2015

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL365929

Work Order #: 365929

Sample ID	Client ID
365929003	B303L5
365929004	B303L4
365929005	B303L7
365929006	B300F9
365929007	B303L6
365929008	B300F8
365929009	B303X3
365929010	B301B6
365929011	B303X5
365929012	B30116
1203253449	Method Blank (MB)ICP
1203253450	Laboratory Control Sample (LCS)
1203253453	365929003(B303L5L) Serial Dilution (SD)
1203253451	365929003(B303L5S) Matrix Spike (MS)
1203253452	365929003(B303L5SD) Matrix Spike Duplicate (MSD)
1203253443	Method Blank (MB)ICP-MS
1203253444	Laboratory Control Sample (LCS)
1203253447	365929003(B303L5L) Serial Dilution (SD)
1203253445	365929003(B303L5S) Matrix Spike (MS)
1203253446	365929003(B303L5SD) Matrix Spike Duplicate (MSD)

Sample Analysis

The samples in this SDG were analyzed on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1453628 and 1453626
Prep Batch :	1453627 and 1453625
Standard Operating Procedures:	GL-MA-E-013 REV# 23, GL-MA-E-006 REV# 11 and GL-MA-E-014 REV# 25
Analytical Method:	SW846 3005A/6010C and SW846 3005A/6020A
Prep Method :	SW846 3005A

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a PE 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 350X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL/PQL Requirements

The CRDL/PQL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the acceptance criteria. The antimony and uranium concentrations were greater than the MDL in blank 1203253443 (MB)-ICP-MS. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 365929003 (B303L5)-ICP and ICP-MS.

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD values between qualifying analyte results in the MS and MSD were within the acceptance limits.

Serial Dilution % Difference Statement

All applicable analytes in the serial dilution (SDILT) demonstrated acceptable correlation to its associated sample and met the established acceptance percent difference criteria.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

The samples in this SDG were not diluted and prepared according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

February 24, 2015

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL365929 GEL Work Order: 365929

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Patricia Steele

Date: 24 FEB 2015

Title: Data Validator

Sample Data Summary

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303L5
Sample ID: 365929003
Matrix: WATER
Collect Date: 27-JAN-15 11:17
Receive Date: 28-JAN-15
Collector: Client

Project: CPRC0S15001
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		74200	+/-14800	50.0	200	ug/L	1	HSC	02/13/15	1436	1453628 1
7440-70-2											
Iron		208	+/-42.8	30.0	100	ug/L	1				
7439-89-6											
Magnesium		21100	+/-4220	110	300	ug/L	1				
7439-95-4											
Potassium		5940	+/-1190	50.0	150	ug/L	1				
7440-09-7											
Vanadium		8.04	+/-1.64	1.00	5.00	ug/L	1				
7440-62-2											
Sodium		32900	+/-6580	100	300	ug/L	1	JWJ	02/20/15	1422	1453628 2
7440-23-5											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.677	+/-0.360	1.00	5.00	ug/L	1	BAJ	02/20/15	1410	1453626 3
7440-36-0											
Arsenic		2.15	+/-0.711	1.70	5.00	ug/L	1				
7440-38-2											
Barium		98.3	+/-19.7	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	0.029	+/-0.0371	0.110	2.00	ug/L	1				
7440-43-9											
Chromium		45.0	+/-9.02	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	B	0.357	+/-0.0788	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.130	+/-0.169	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	B	3.87	+/-0.843	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	2.96	+/-0.594	0.165	20.0	ug/L	1				
7439-98-7											
Nickel		12.6	+/-2.52	0.500	2.00	ug/L	1				
7440-02-0											
Silver	U	0.081	+/-0.0686	0.200	2.00	ug/L	1				

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303L5
Sample ID: 365929003

Project: CPRC0S15001
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Metals Analysis-ICP-MS

6020_METALS_ICPMS: GW 01 "As Received"

7440-22-4											
Strontium		537	+/-107	2.00	10.0	ug/L	1				
7440-24-6											
Thallium	U	0.017	+/-0.150	0.450	2.00	ug/L	1				
7440-28-0											
Thorium	U	0.088	+/-0.129	0.383	2.00	ug/L	1				
7440-29-1											
Tin	U	0.248	+/-0.337	1.00	5.00	ug/L	1				
7440-31-5											
Zinc	U	3.13	+/-1.32	3.50	10.0	ug/L	1				
7440-66-6											
Aluminum		83.9	+/-17.5	15.0	50.0	ug/L	1	BAJ	02/20/15	1742	1453626 4
7429-90-5											
Boron		20.6	+/-4.32	4.00	15.0	ug/L	1				
7440-42-8											
Copper	B	1.37	+/-0.297	0.350	8.00	ug/L	1				
7440-50-8											
Uranium	C	3.33	+/-0.666	0.067	0.200	ug/L	1				
7440-61-1											
Beryllium	U	0.028	+/-0.0669	0.200	2.00	ug/L	1	SKJ	02/23/15	1416	1453626 5
7440-41-7											
Selenium	B	1.74	+/-0.609	1.50	5.00	ug/L	1	BAJ	02/23/15	1222	1453626 6
7782-49-2											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	
6	SW846 3005A/6020A	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303L4
 Sample ID: 365929004
 Matrix: WATER
 Collect Date: 27-JAN-15 11:17
 Receive Date: 28-JAN-15
 Collector: Client

Project: CPRC0S15001
 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		74400	+/-14900	50.0	200	ug/L	1	HSC	02/13/15	1447	1453628 1
7440-70-2											
Iron	B	34.8	+/-12.2	30.0	100	ug/L	1				
7439-89-6											
Magnesium		21100	+/-4230	110	300	ug/L	1				
7439-95-4											
Potassium		5980	+/-1200	50.0	150	ug/L	1				
7440-09-7											
Vanadium		7.60	+/-1.56	1.00	5.00	ug/L	1				
7440-62-2											
Sodium		33800	+/-6750	100	300	ug/L	1	JWJ	02/20/15	1437	1453628 2
7440-23-5											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.728	+/-0.364	1.00	5.00	ug/L	1	BAJ	02/20/15	1429	1453626 3
7440-36-0											
Arsenic		2.17	+/-0.714	1.70	5.00	ug/L	1				
7440-38-2											
Barium		102	+/-20.3	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	0.021	+/-0.0369	0.110	2.00	ug/L	1				
7440-43-9											
Chromium		24.2	+/-4.88	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	B	0.229	+/-0.0566	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.018	+/-0.167	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	B	1.72	+/-0.478	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	2.70	+/-0.543	0.165	20.0	ug/L	1				
7439-98-7											
Nickel		6.86	+/-1.38	0.500	2.00	ug/L	1				
7440-02-0											
Selenium	B	2.56	+/-0.716	1.50	5.00	ug/L	1				

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303L4
 Sample ID: 365929004

Project: CPRC0S15001
 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Metals Analysis-ICP-MS

6020_METALS_ICPMS: GW 01 "As Received"

7782-49-2											
Silver	U	0.023	+/-0.0668	0.200	2.00	ug/L	1				
7440-22-4											
Strontium		542	+/-108	2.00	10.0	ug/L	1				
7440-24-6											
Thallium	U	0.061	+/-0.150	0.450	2.00	ug/L	1				
7440-28-0											
Thorium	U	0.063	+/-0.128	0.383	2.00	ug/L	1				
7440-29-1											
Tin	U	0.146	+/-0.335	1.00	5.00	ug/L	1				
7440-31-5											
Zinc	U	2.06	+/-1.24	3.50	10.0	ug/L	1				
7440-66-6											
Aluminum	U	11.3	+/-5.49	15.0	50.0	ug/L	1	BAJ	02/20/15	1758	1453626 4
7429-90-5											
Boron		21.2	+/-4.44	4.00	15.0	ug/L	1				
7440-42-8											
Copper	B	0.538	+/-0.159	0.350	8.00	ug/L	1				
7440-50-8											
Uranium	C	3.30	+/-0.659	0.067	0.200	ug/L	1				
7440-61-1											
Beryllium	U	0.016	+/-0.0667	0.200	2.00	ug/L	1	SKJ	02/23/15	1423	1453626 5
7440-41-7											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

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Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID:	B303L7	Project:	CPRC0S15001
Sample ID:	365929005	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	26-JAN-15 11:59		
Receive Date:	28-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		65200	+/-13000	50.0	200	ug/L	1	HSC	02/13/15	1456	1453628 1
7440-70-2											
Iron	U	9.87	+/-10.2	30.0	100	ug/L	1				
7439-89-6											
Magnesium		12000	+/-2400	110	300	ug/L	1				
7439-95-4											
Potassium		4680	+/-937	50.0	150	ug/L	1				
7440-09-7											
Vanadium		5.92	+/-1.23	1.00	5.00	ug/L	1				
7440-62-2											
Sodium		21300	+/-4250	100	300	ug/L	1	JWJ	02/20/15	1440	1453628 2
7440-23-5											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.509	+/-0.349	1.00	5.00	ug/L	1	BAJ	02/20/15	1431	1453626 3
7440-36-0											
Arsenic		2.47	+/-0.752	1.70	5.00	ug/L	1				
7440-38-2											
Barium		46.4	+/-9.29	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	0.008	+/-0.0367	0.110	2.00	ug/L	1				
7440-43-9											
Chromium		10.2	+/-2.15	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	U	0.078	+/-0.0368	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.024	+/-0.167	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	U	0.297	+/-0.339	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	2.07	+/-0.418	0.165	20.0	ug/L	1				
7439-98-7											
Nickel	B	0.646	+/-0.211	0.500	2.00	ug/L	1				
7440-02-0											
Selenium	U	1.33	+/-0.566	1.50	5.00	ug/L	1				

GEL LABORATORIES LLC

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Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303L7
 Sample ID: 365929005

Project: CPRC0S15001
 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Metals Analysis-ICP-MS

6020_METALS_ICPMS: GW 01 "As Received"

7782-49-2											
Silver	U	0.007	+/-0.0667	0.200	2.00	ug/L	1				
7440-22-4											
Strontium		352	+/-70.4	2.00	10.0	ug/L	1				
7440-24-6											
Thallium	U	0.021	+/-0.150	0.450	2.00	ug/L	1				
7440-28-0											
Thorium	U	0.025	+/-0.128	0.383	2.00	ug/L	1				
7440-29-1											
Tin	U	0.225	+/-0.336	1.00	5.00	ug/L	1				
7440-31-5											
Zinc	U	3.18	+/-1.33	3.50	10.0	ug/L	1				
7440-66-6											
Aluminum	U	9.03	+/-5.32	15.0	50.0	ug/L	1	BAJ	02/20/15	1759	1453626 4
7429-90-5											
Boron		20.8	+/-4.36	4.00	15.0	ug/L	1				
7440-42-8											
Copper	B	0.390	+/-0.140	0.350	8.00	ug/L	1				
7440-50-8											
Uranium	C	3.46	+/-0.692	0.067	0.200	ug/L	1				
7440-61-1											
Beryllium	U	0.012	+/-0.0667	0.200	2.00	ug/L	1	SKJ	02/23/15	1424	1453626 5
7440-41-7											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID:	B300F9	Project:	CPRC0S15001
Sample ID:	365929006	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	26-JAN-15 11:59		
Receive Date:	28-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		64900	+/-13000	50.0	200	ug/L	1	HSC	02/13/15	1459	1453628 1
7440-70-2											
Iron		116	+/-25.2	30.0	100	ug/L	1				
7439-89-6											
Magnesium		12100	+/-2430	110	300	ug/L	1				
7439-95-4											
Potassium		4900	+/-979	50.0	150	ug/L	1				
7440-09-7											
Vanadium		6.10	+/-1.26	1.00	5.00	ug/L	1				
7440-62-2											
Sodium		21100	+/-4230	100	300	ug/L	1	JWJ	02/20/15	1443	1453628 2
7440-23-5											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.508	+/-0.348	1.00	5.00	ug/L	1	BAJ	02/20/15	1434	1453626 3
7440-36-0											
Arsenic		2.47	+/-0.752	1.70	5.00	ug/L	1				
7440-38-2											
Barium		47.0	+/-9.40	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	0.008	+/-0.0367	0.110	2.00	ug/L	1				
7440-43-9											
Chromium		10.9	+/-2.29	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	U	0.062	+/-0.0356	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.170	+/-0.170	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	B	1.75	+/-0.483	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	2.12	+/-0.428	0.165	20.0	ug/L	1				
7439-98-7											
Nickel	B	0.796	+/-0.230	0.500	2.00	ug/L	1				
7440-02-0											
Selenium	U	1.25	+/-0.559	1.50	5.00	ug/L	1				

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B300F9
 Sample ID: 365929006
 Project: CPRC0S15001
 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
7782-49-2											
Silver	U	0.018	+/-0.0668	0.200	2.00	ug/L	1				
7440-22-4											
Strontium		355	+/-70.9	2.00	10.0	ug/L	1				
7440-24-6											
Thallium	U	0.014	+/-0.150	0.450	2.00	ug/L	1				
7440-28-0											
Thorium	U	0.034	+/-0.128	0.383	2.00	ug/L	1				
7440-29-1											
Tin	U	0.574	+/-0.353	1.00	5.00	ug/L	1				
7440-31-5											
Zinc	U	1.93	+/-1.23	3.50	10.0	ug/L	1				
7440-66-6											
Aluminum		88.0	+/-18.3	15.0	50.0	ug/L	1	BAJ	02/20/15	1801	1453626 4
7429-90-5											
Boron		19.9	+/-4.20	4.00	15.0	ug/L	1				
7440-42-8											
Copper	B	0.571	+/-0.163	0.350	8.00	ug/L	1				
7440-50-8											
Uranium	C	3.49	+/-0.697	0.067	0.200	ug/L	1				
7440-61-1											
Beryllium	U	0.002	+/-0.0667	0.200	2.00	ug/L	1	SKJ	02/23/15	1425	1453626 5
7440-41-7											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID:	B303L6	Project:	CPRC0S15001
Sample ID:	365929007	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	26-JAN-15 09:30		
Receive Date:	28-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>												
Calcium	U	-2.08	+/-16.7	50.0	200	ug/L	1	HSC	02/13/15	1502	1453628	1
7440-70-2												
Iron		135	+/-28.8	30.0	100	ug/L	1					
7439-89-6												
Magnesium	U	26.3	+/-37.0	110	300	ug/L	1					
7439-95-4												
Potassium	U	-28.7	+/-17.6	50.0	150	ug/L	1					
7440-09-7												
Vanadium	U	0.215	+/-0.336	1.00	5.00	ug/L	1					
7440-62-2												
Sodium	U	10.5	+/-33.4	100	300	ug/L	1	JWJ	02/20/15	1446	1453628	2
7440-23-5												
Metals Analysis-ICP-MS												
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>												
Antimony	U	0.277	+/-0.338	1.00	5.00	ug/L	1	BAJ	02/20/15	1436	1453626	3
7440-36-0												
Arsenic	U	0.045	+/-0.567	1.70	5.00	ug/L	1					
7440-38-2												
Barium	U	0.197	+/-0.204	0.600	5.00	ug/L	1					
7440-39-3												
Cadmium	U	0.019	+/-0.0369	0.110	2.00	ug/L	1					
7440-43-9												
Chromium	U	0.085	+/-0.667	2.00	10.0	ug/L	1					
7440-47-3												
Cobalt	U	0.020	+/-0.0336	0.100	4.00	ug/L	1					
7440-48-4												
Lead	U	0.027	+/-0.167	0.500	2.00	ug/L	1					
7439-92-1												
Manganese	U	0.068	+/-0.334	1.00	5.00	ug/L	1					
7439-96-5												
Molybdenum	U	0.030	+/-0.0553	0.165	20.0	ug/L	1					
7439-98-7												
Nickel	U	0.039	+/-0.167	0.500	2.00	ug/L	1					
7440-02-0												
Selenium	U	-0.089	+/-0.500	1.50	5.00	ug/L	1					

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303L6
 Sample ID: 365929007

Project: CPRC0S15001
 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Metals Analysis-ICP-MS

6020_METALS_ICPMS: GW 01 "As Received"

7782-49-2											
Silver	U	0.022	+/-0.0668	0.200	2.00	ug/L	1				
7440-22-4											
Strontium	U	0.537	+/-0.675	2.00	10.0	ug/L	1				
7440-24-6											
Thallium	U	0.029	+/-0.150	0.450	2.00	ug/L	1				
7440-28-0											
Thorium	U	0.031	+/-0.128	0.383	2.00	ug/L	1				
7440-29-1											
Tin	U	0.123	+/-0.334	1.00	5.00	ug/L	1				
7440-31-5											
Zinc	U	0.792	+/-1.18	3.50	10.0	ug/L	1				
7440-66-6											
Aluminum	U	3.12	+/-5.04	15.0	50.0	ug/L	1	BAJ	02/20/15	1803	1453626 4
7429-90-5											
Boron	U	1.60	+/-1.37	4.00	15.0	ug/L	1				
7440-42-8											
Copper	U	0.013	+/-0.117	0.350	8.00	ug/L	1				
7440-50-8											
Uranium	U	0.004	+/-0.0223	0.067	0.200	ug/L	1				
7440-61-1											
Beryllium	U	-0.015	+/-0.0667	0.200	2.00	ug/L	1	SKJ	02/23/15	1426	1453626 5
7440-41-7											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID:	B300F8	Project:	CPRC0S15001
Sample ID:	365929008	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	26-JAN-15 09:30		
Receive Date:	28-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium	U	-2.97	+/-16.7	50.0	200	ug/L	1	HSC	02/13/15	1506	1453628 1
7440-70-2											
Iron	U	3.83	+/-10.0	30.0	100	ug/L	1				
7439-89-6											
Magnesium	U	10.1	+/-36.7	110	300	ug/L	1				
7439-95-4											
Potassium	U	12.3	+/-16.8	50.0	150	ug/L	1				
7440-09-7											
Vanadium	U	0.255	+/-0.337	1.00	5.00	ug/L	1				
7440-62-2											
Sodium	U	9.45	+/-33.4	100	300	ug/L	1	JWJ	02/20/15	1449	1453628 2
7440-23-5											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.176	+/-0.335	1.00	5.00	ug/L	1	BAJ	02/20/15	1438	1453626 3
7440-36-0											
Arsenic	U	-0.004	+/-0.567	1.70	5.00	ug/L	1				
7440-38-2											
Barium	U	0.068	+/-0.200	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	-0.001	+/-0.0367	0.110	2.00	ug/L	1				
7440-43-9											
Chromium	U	0.065	+/-0.667	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	U	-0.002	+/-0.0333	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.002	+/-0.167	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	U	0.060	+/-0.334	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	U	-0.003	+/-0.055	0.165	20.0	ug/L	1				
7439-98-7											
Nickel	U	0.043	+/-0.167	0.500	2.00	ug/L	1				
7440-02-0											
Selenium	U	0.135	+/-0.501	1.50	5.00	ug/L	1				

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B300F8
 Sample ID: 365929008

Project: CPRC0S15001
 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Metals Analysis-ICP-MS

6020_METALS_ICPMS: GW 01 "As Received"

7782-49-2											
Silver	U	0.00	+/-0.0667	0.200	2.00	ug/L	1				
7440-22-4											
Strontium	U	0.151	+/-0.667	2.00	10.0	ug/L	1				
7440-24-6											
Thallium	U	0.003	+/-0.150	0.450	2.00	ug/L	1				
7440-28-0											
Thorium	U	0.007	+/-0.128	0.383	2.00	ug/L	1				
7440-29-1											
Tin	U	0.117	+/-0.334	1.00	5.00	ug/L	1				
7440-31-5											
Zinc	U	0.668	+/-1.17	3.50	10.0	ug/L	1				
7440-66-6											
Aluminum	U	2.86	+/-5.03	15.0	50.0	ug/L	1	BAJ	02/20/15	1805	1453626 4
7429-90-5											
Boron	U	1.26	+/-1.36	4.00	15.0	ug/L	1				
7440-42-8											
Copper	U	-0.004	+/-0.117	0.350	8.00	ug/L	1				
7440-50-8											
Uranium	U	0.002	+/-0.0223	0.067	0.200	ug/L	1				
7440-61-1											
Beryllium	U	-0.008	+/-0.0667	0.200	2.00	ug/L	1	SKJ	02/23/15	1427	1453626 5
7440-41-7											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303X3
Sample ID: 365929009
Matrix: WATER
Collect Date: 27-JAN-15 08:35
Receive Date: 28-JAN-15
Collector: Client

Project: CPRC0S15001
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		39100	+/-7830	50.0	200	ug/L	1	HSC	02/13/15	1509	1453628 1
7440-70-2											
Iron	B	87.7	+/-20.2	30.0	100	ug/L	1				
7439-89-6											
Magnesium		10900	+/-2170	110	300	ug/L	1				
7439-95-4											
Potassium		5110	+/-1020	50.0	150	ug/L	1				
7440-09-7											
Vanadium		18.0	+/-3.62	1.00	5.00	ug/L	1				
7440-62-2											
Sodium		17600	+/-3520	100	300	ug/L	1	JWJ	02/20/15	1452	1453628 2
7440-23-5											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.315	+/-0.339	1.00	5.00	ug/L	1	BAJ	02/20/15	1441	1453626 3
7440-36-0											
Arsenic		5.53	+/-1.24	1.70	5.00	ug/L	1				
7440-38-2											
Barium		55.2	+/-11.0	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	0.015	+/-0.0368	0.110	2.00	ug/L	1				
7440-43-9											
Chromium		3.92	+/-1.03	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	U	0.016	+/-0.0335	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.029	+/-0.167	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	B	1.12	+/-0.401	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	3.06	+/-0.614	0.165	20.0	ug/L	1				
7439-98-7											
Nickel	U	0.395	+/-0.184	0.500	2.00	ug/L	1				
7440-02-0											
Silver	U	0.009	+/-0.0667	0.200	2.00	ug/L	1				

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303X3
 Sample ID: 365929009

Project: CPRC0S15001
 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Metals Analysis-ICP-MS

6020_METALS_ICPMS: GW 01 "As Received"

7440-22-4		305	+/-61.1	2.00	10.0	ug/L	1				
Strontium											
7440-24-6	U	0.004	+/-0.150	0.450	2.00	ug/L	1				
Thallium											
7440-28-0	U	0.010	+/-0.128	0.383	2.00	ug/L	1				
Thorium											
7440-29-1	U	0.129	+/-0.334	1.00	5.00	ug/L	1				
Tin											
7440-31-5	B	5.50	+/-1.60	3.50	10.0	ug/L	1				
Zinc											
7440-66-6	U	3.53	+/-5.05	15.0	50.0	ug/L	1	BAJ	02/20/15	1807	1453626 4
Aluminum											
7429-90-5		16.1	+/-3.48	4.00	15.0	ug/L	1				
Boron											
7440-42-8	U	0.054	+/-0.117	0.350	8.00	ug/L	1				
Copper											
7440-50-8		4.58	+/-0.915	0.067	0.200	ug/L	1				
Uranium											
7440-61-1	U	-0.007	+/-0.0667	0.200	2.00	ug/L	1	SKJ	02/23/15	1432	1453626 5
Beryllium											
7440-41-7	B	1.60	+/-0.593	1.50	5.00	ug/L	1	BAJ	02/23/15	1234	1453626 6
Selenium											
7782-49-2											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	
6	SW846 3005A/6020A	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B301B6
Sample ID: 365929010
Matrix: WATER
Collect Date: 27-JAN-15 08:35
Receive Date: 28-JAN-15
Collector: Client

Project: CPRC0S15001
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		39100	+/-7820	50.0	200	ug/L	1	HSC	02/13/15	1512	1453628 1
7440-70-2											
Iron	B	40.6	+/-12.9	30.0	100	ug/L	1				
7439-89-6											
Magnesium		10900	+/-2170	110	300	ug/L	1				
7439-95-4											
Potassium		5130	+/-1030	50.0	150	ug/L	1				
7440-09-7											
Vanadium		17.8	+/-3.57	1.00	5.00	ug/L	1				
7440-62-2											
Sodium		17800	+/-3560	100	300	ug/L	1	JWJ	02/20/15	1455	1453628 2
7440-23-5											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.406	+/-0.343	1.00	5.00	ug/L	1	BAJ	02/20/15	1443	1453626 3
7440-36-0											
Arsenic		5.35	+/-1.21	1.70	5.00	ug/L	1				
7440-38-2											
Barium		54.7	+/-10.9	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	-0.002	+/-0.0367	0.110	2.00	ug/L	1				
7440-43-9											
Chromium		3.64	+/-0.987	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	B	0.483	+/-0.102	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.011	+/-0.167	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	B	1.23	+/-0.414	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	3.12	+/-0.625	0.165	20.0	ug/L	1				
7439-98-7											
Nickel	U	0.447	+/-0.189	0.500	2.00	ug/L	1				
7440-02-0											
Silver	U	0.001	+/-0.0667	0.200	2.00	ug/L	1				

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B301B6
Sample ID: 365929010

Project: CPRC0S15001
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Metals Analysis-ICP-MS

6020_METALS_ICPMS: GW 01 "As Received"

7440-22-4		302	+/-60.4	2.00	10.0	ug/L	1				
Strontium											
7440-24-6	U	0.002	+/-0.150	0.450	2.00	ug/L	1				
Thallium											
7440-28-0	U	0.007	+/-0.128	0.383	2.00	ug/L	1				
Thorium											
7440-29-1	U	0.157	+/-0.335	1.00	5.00	ug/L	1				
Tin											
7440-31-5	B	4.38	+/-1.46	3.50	10.0	ug/L	1				
Zinc											
7440-66-6	U	3.64	+/-5.05	15.0	50.0	ug/L	1	BAJ	02/20/15	1809	1453626 4
Aluminum											
7429-90-5		16.6	+/-3.57	4.00	15.0	ug/L	1				
Boron											
7440-42-8	U	0.052	+/-0.117	0.350	8.00	ug/L	1				
Copper											
7440-50-8		4.56	+/-0.913	0.067	0.200	ug/L	1				
Uranium											
7440-61-1	U	-0.023	+/-0.0668	0.200	2.00	ug/L	1	SKJ	02/23/15	1433	1453626 5
Beryllium											
7440-41-7	B	1.82	+/-0.618	1.50	5.00	ug/L	1	BAJ	02/23/15	1238	1453626 6
Selenium											
7782-49-2											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	
6	SW846 3005A/6020A	

February 24, 2015 GEL LABORATORIES LLC

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Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303X5
Sample ID: 365929011
Matrix: WATER
Collect Date: 27-JAN-15 10:40
Receive Date: 28-JAN-15
Collector: Client

Project: CPRC0S15001
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		20500	+/-4090	50.0	200	ug/L	1	HSC	02/13/15	1515	1453628 1
7440-70-2											
Iron	U	9.77	+/-10.2	30.0	100	ug/L	1				
7439-89-6											
Magnesium		4940	+/-988	110	300	ug/L	1				
7439-95-4											
Potassium		1030	+/-206	50.0	150	ug/L	1				
7440-09-7											
Vanadium	B	1.59	+/-0.461	1.00	5.00	ug/L	1				
7440-62-2											
Sodium		3660	+/-732	100	300	ug/L	1	JWJ	02/20/15	1457	1453628 2
7440-23-5											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.236	+/-0.337	1.00	5.00	ug/L	1	BAJ	02/20/15	1446	1453626 3
7440-36-0											
Arsenic	U	0.986	+/-0.600	1.70	5.00	ug/L	1				
7440-38-2											
Barium		23.2	+/-4.64	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	0.021	+/-0.0369	0.110	2.00	ug/L	1				
7440-43-9											
Chromium	U	1.40	+/-0.723	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	U	0.047	+/-0.0346	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.021	+/-0.167	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	U	0.302	+/-0.339	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	0.855	+/-0.180	0.165	20.0	ug/L	1				
7439-98-7											
Nickel	U	0.433	+/-0.188	0.500	2.00	ug/L	1				
7440-02-0											
Selenium	U	0.714	+/-0.520	1.50	5.00	ug/L	1				

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Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B303X5
 Sample ID: 365929011
 Project: CPRC0S15001
 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
7782-49-2											
Silver	U	0.016	+/-0.0667	0.200	2.00	ug/L	1				
7440-22-4											
Strontium		109	+/-21.8	2.00	10.0	ug/L	1				
7440-24-6											
Thallium	U	0.003	+/-0.150	0.450	2.00	ug/L	1				
7440-28-0											
Thorium	U	0.002	+/-0.128	0.383	2.00	ug/L	1				
7440-29-1											
Tin	U	0.165	+/-0.335	1.00	5.00	ug/L	1				
7440-31-5											
Zinc	U	1.74	+/-1.22	3.50	10.0	ug/L	1				
7440-66-6											
Aluminum	U	8.55	+/-5.28	15.0	50.0	ug/L	1	BAJ	02/20/15	1811	1453626 4
7429-90-5											
Boron	B	4.62	+/-1.62	4.00	15.0	ug/L	1				
7440-42-8											
Copper	B	0.703	+/-0.183	0.350	8.00	ug/L	1				
7440-50-8											
Uranium	C	1.09	+/-0.219	0.067	0.200	ug/L	1				
7440-61-1											
Beryllium	U	-0.018	+/-0.0668	0.200	2.00	ug/L	1	SKJ	02/23/15	1434	1453626 5
7440-41-7											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 24, 2015

Client Sample ID: B30116
Sample ID: 365929012
Matrix: WATER
Collect Date: 27-JAN-15 10:40
Receive Date: 28-JAN-15
Collector: Client

Project: CPRC0S15001
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
<i>6010_METALS_ICP:GW 04 (6 metals) "As Received"</i>											
Calcium		20400	+/-4090	50.0	200	ug/L	1	HSC	02/13/15	1518	1453628 1
7440-70-2											
Iron		154	+/-32.5	30.0	100	ug/L	1				
7439-89-6											
Magnesium		5000	+/-1000	110	300	ug/L	1				
7439-95-4											
Potassium		1080	+/-216	50.0	150	ug/L	1				
7440-09-7											
Vanadium	B	1.61	+/-0.463	1.00	5.00	ug/L	1				
7440-62-2											
Sodium		3680	+/-736	100	300	ug/L	1	JWJ	02/20/15	1500	1453628 2
7440-23-5											
Metals Analysis-ICP-MS											
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>											
Antimony	U	0.223	+/-0.336	1.00	5.00	ug/L	1	BAJ	02/20/15	1448	1453626 3
7440-36-0											
Arsenic	U	0.734	+/-0.585	1.70	5.00	ug/L	1				
7440-38-2											
Barium		24.9	+/-4.98	0.600	5.00	ug/L	1				
7440-39-3											
Cadmium	U	0.037	+/-0.0374	0.110	2.00	ug/L	1				
7440-43-9											
Chromium		2.66	+/-0.853	2.00	10.0	ug/L	1				
7440-47-3											
Cobalt	U	0.085	+/-0.0374	0.100	4.00	ug/L	1				
7440-48-4											
Lead	U	0.107	+/-0.168	0.500	2.00	ug/L	1				
7439-92-1											
Manganese	B	3.52	+/-0.779	1.00	5.00	ug/L	1				
7439-96-5											
Molybdenum	B	0.882	+/-0.185	0.165	20.0	ug/L	1				
7439-98-7											
Nickel	B	1.08	+/-0.272	0.500	2.00	ug/L	1				
7440-02-0											
Selenium	U	0.801	+/-0.525	1.50	5.00	ug/L	1				

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF S15-001

Report Date: February 24, 2015

Client Sample ID: B30116
 Sample ID: 365929012

Project: CPRC0S15001
 Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Metals Analysis-ICP-MS

6020_METALS_ICPMS: GW 01 "As Received"

7782-49-2											
Silver	U	0.025	+/-0.0669	0.200	2.00	ug/L	1				
7440-22-4											
Strontium		110	+/-21.9	2.00	10.0	ug/L	1				
7440-24-6											
Thallium	U	0.006	+/-0.150	0.450	2.00	ug/L	1				
7440-28-0											
Thorium	U	0.023	+/-0.128	0.383	2.00	ug/L	1				
7440-29-1											
Tin	U	0.155	+/-0.335	1.00	5.00	ug/L	1				
7440-31-5											
Zinc	U	2.10	+/-1.24	3.50	10.0	ug/L	1				
7440-66-6											
Aluminum		141	+/-28.6	15.0	50.0	ug/L	1	BAJ	02/20/15	1813	1453626 4
7429-90-5											
Boron	B	4.73	+/-1.63	4.00	15.0	ug/L	1				
7440-42-8											
Copper	B	1.22	+/-0.270	0.350	8.00	ug/L	1				
7440-50-8											
Uranium	C	1.10	+/-0.221	0.067	0.200	ug/L	1				
7440-61-1											
Beryllium	U	0.003	+/-0.0667	0.200	2.00	ug/L	1	SKJ	02/23/15	1435	1453626 5
7440-41-7											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	01/29/15	0800	1453625
SW846 3005A	SW846 3005A for 6010C	JXM5	01/29/15	0800	1453627

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	
5	SW846 3005A/6020A	

Quality Control Summary

February 24, 2015
GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: February 24, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 365929

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1453626										
QC1203253444	LCS										
Aluminum	2000			2100	ug/L		105	(80%-120%)	BAJ	02/20/15	17:37
Antimony	50.0			52.7	ug/L		105	(80%-120%)		02/20/15	14:02
Arsenic	50.0			44.5	ug/L		89.1	(80%-120%)			
Barium	50.0			51.8	ug/L		104	(80%-120%)			
Beryllium	50.0			59.3	ug/L		119	(80%-120%)	SKJ	02/23/15	14:41
Boron	100			97.6	ug/L		97.6	(80%-120%)	BAJ	02/20/15	17:37
Cadmium	50.0			52.8	ug/L		106	(80%-120%)		02/20/15	14:02
Chromium	50.0			53.6	ug/L		107	(80%-120%)			
Cobalt	50.0			53.1	ug/L		106	(80%-120%)			
Copper	50.0			51.2	ug/L		102	(80%-120%)		02/20/15	17:37
Lead	50.0			51.7	ug/L		103	(80%-120%)		02/20/15	14:02
Manganese	50.0			51.0	ug/L		102	(80%-120%)			
Molybdenum	50.0			51.2	ug/L		102	(80%-120%)			
Nickel	50.0			53.6	ug/L		107	(80%-120%)			
Selenium	50.0			53.9	ug/L		108	(80%-120%)		02/23/15	12:09
Silver	50.0			52.4	ug/L		105	(80%-120%)		02/20/15	14:02
Strontium	50.0			52.3	ug/L		105	(80%-120%)			
Thallium	50.0			50.7	ug/L		101	(80%-120%)			
Thorium	50.0			51.6	ug/L		103	(80%-120%)			
Tin	50.0			53.0	ug/L		106	(80%-120%)			

February 24, 2015
GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 365929

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1453626										
Uranium	50.0			51.9	ug/L		104	(80%-120%)	BAJ	02/20/15	17:37
Zinc	50.0			52.8	ug/L		106	(80%-120%)		02/20/15	14:02
QC1203253443 MB Aluminum			U	ND	ug/L					02/20/15	17:35
Antimony			B	1.76	ug/L					02/20/15	14:00
Arsenic			U	ND	ug/L						
Barium			U	ND	ug/L						
Beryllium			U	ND	ug/L				SKJ	02/23/15	14:09
Boron			U	ND	ug/L				BAJ	02/20/15	17:35
Cadmium			U	ND	ug/L					02/20/15	14:00
Chromium			U	ND	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L					02/20/15	17:35
Lead			U	ND	ug/L					02/20/15	14:00
Manganese			U	ND	ug/L						
Molybdenum			U	ND	ug/L						
Nickel			U	ND	ug/L						
Selenium			U	ND	ug/L					02/23/15	12:07
Silver			U	ND	ug/L					02/20/15	14:00
Strontium			U	ND	ug/L						
Thallium			U	ND	ug/L						
Thorium			U	ND	ug/L						

February 24, 2015
GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 365929

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1453626										
Tin			U	ND	ug/L				BAJ	02/20/15	14:00
Uranium			B	0.177	ug/L					02/20/15	17:35
Zinc			U	ND	ug/L					02/20/15	14:00
QC1203253445 365929003 MS											
Aluminum	2000		83.9	2160	ug/L		104	(75%-125%)		02/20/15	17:44
Antimony	50.0	U	ND	53.4	ug/L		105	(75%-125%)		02/20/15	14:12
Arsenic	50.0		2.15	47.3	ug/L		90.3	(75%-125%)			
Barium	50.0		98.3	151	ug/L		106	(75%-125%)			
Beryllium	50.0	U	ND	58.6	ug/L		117	(75%-125%)	SKJ	02/23/15	14:17
Boron	100		20.6	117	ug/L		96	(75%-125%)	BAJ	02/20/15	17:44
Cadmium	50.0	U	ND	51.2	ug/L		102	(75%-125%)		02/20/15	14:12
Chromium	50.0		45.0	94.8	ug/L		99.6	(75%-125%)			
Cobalt	50.0	B	0.357	49.6	ug/L		98.6	(75%-125%)			
Copper	50.0	B	1.37	49.5	ug/L		96.3	(75%-125%)		02/20/15	17:44
Lead	50.0	U	ND	48.6	ug/L		96.9	(75%-125%)		02/20/15	14:12
Manganese	50.0	B	3.87	54.1	ug/L		100	(75%-125%)			
Molybdenum	50.0	B	2.96	55.3	ug/L		105	(75%-125%)			
Nickel	50.0		12.6	61.3	ug/L		97.5	(75%-125%)			
Selenium	50.0	B	1.74	55.1	ug/L		107	(75%-125%)		02/23/15	12:23
Silver	50.0	U	ND	49.3	ug/L		98.4	(75%-125%)		02/20/15	14:12
Strontium	50.0		537	602	ug/L		N/A	(75%-125%)			
Thallium	50.0	U	ND	48.4	ug/L		96.7	(75%-125%)			

February 24, 2015
GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 365929

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1453626										
Thorium	50.0	U	ND	50.6	ug/L		101	(75%-125%)	BAJ	02/20/15	14:12
Tin	50.0	U	ND	52.8	ug/L		105	(75%-125%)			
Uranium	50.0	C	3.33	54.8	ug/L		103	(75%-125%)		02/20/15	17:44
Zinc	50.0	U	ND	50.0	ug/L		93.7	(75%-125%)		02/20/15	14:12
QC1203253446 365929003 MSD											
Aluminum	2000		83.9	2180	ug/L	1.01	105	(0%-20%)		02/20/15	17:46
Antimony	50.0	U	ND	53.6	ug/L	0.366	106	(0%-20%)		02/20/15	14:14
Arsenic	50.0		2.15	48.9	ug/L	3.34	93.5	(0%-20%)			
Barium	50.0		98.3	155	ug/L	2.21	113	(0%-20%)			
Beryllium	50.0	U	ND	56.1	ug/L	4.33	112	(0%-20%)	SKJ	02/23/15	14:18
Boron	100		20.6	119	ug/L	2.40	98.9	(0%-20%)	BAJ	02/20/15	17:46
Cadmium	50.0	U	ND	51.0	ug/L	0.483	102	(0%-20%)		02/20/15	14:14
Chromium	50.0		45.0	96.0	ug/L	1.24	102	(0%-20%)			
Cobalt	50.0	B	0.357	50.2	ug/L	1.16	99.7	(0%-20%)			
Copper	50.0	B	1.37	55.4	ug/L	11.3	108	(0%-20%)		02/20/15	17:46
Lead	50.0	U	ND	48.9	ug/L	0.593	97.5	(0%-20%)		02/20/15	14:14
Manganese	50.0	B	3.87	54.1	ug/L	0.105	100	(0%-20%)			
Molybdenum	50.0	B	2.96	55.5	ug/L	0.303	105	(0%-20%)			
Nickel	50.0		12.6	61.3	ug/L	0.0914	97.4	(0%-20%)			
Selenium	50.0	B	1.74	56.9	ug/L	3.21	110	(0%-20%)		02/23/15	12:25
Silver	50.0	U	ND	49.2	ug/L	0.0771	98.3	(0%-20%)		02/20/15	14:14
Strontium	50.0		537	598	ug/L	0.579	N/A	(0%-20%)			

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QC Summary

Workorder: 365929

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1453626										
Thallium	50.0	U	ND	49.1	ug/L	1.38	98.1	(0%-20%)	BAJ	02/20/15	14:14
Thorium	50.0	U	ND	51.9	ug/L	2.43	104	(0%-20%)			
Tin	50.0	U	ND	53.1	ug/L	0.482	106	(0%-20%)			
Uranium	50.0	C	3.33	55.3	ug/L	0.841	104	(0%-20%)		02/20/15	17:46
Zinc	50.0	U	ND	49.9	ug/L	0.140	93.6	(0%-20%)		02/20/15	14:14
QC1203253447 365929003 SDILT											
Aluminum			83.9 D	17.1	ug/L	2.03		(0%-10%)		02/20/15	17:50
Antimony		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/20/15	14:19
Arsenic			2.15 DU	ND	ug/L	N/A		(0%-10%)			
Barium			98.3 D	21.2	ug/L	7.97		(0%-10%)			
Beryllium		U	ND DU	ND	ug/L	N/A		(0%-10%)	SKJ	02/23/15	14:19
Boron			20.6 D	6.26	ug/L	52.2		(0%-10%)	BAJ	02/20/15	17:50
Cadmium		U	ND D	0.156	ug/L	N/A		(0%-10%)		02/20/15	14:19
Chromium			45.0 D	9.57	ug/L	6.3		(0%-10%)			
Cobalt		B	0.357 D	0.180	ug/L	152		(0%-10%)			
Copper		B	1.37 DU	ND	ug/L	N/A		(0%-10%)		02/20/15	17:50
Lead		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/20/15	14:19
Manganese		B	3.87 DU	ND	ug/L	N/A		(0%-10%)			
Molybdenum		B	2.96 D	0.865	ug/L	46.3		(0%-10%)			
Nickel			12.6 D	2.81	ug/L	11.7		(0%-10%)			
Selenium		B	1.74 DU	ND	ug/L	N/A		(0%-10%)		02/23/15	12:28
Silver		U	ND DU	ND	ug/L	N/A		(0%-10%)		02/20/15	14:19

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1453626										
Strontium		537	D	111	ug/L	3.19		(0%-10%)	BAJ	02/20/15	14:19
Thallium	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Thorium	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Tin	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Uranium	C	3.33	D	0.689	ug/L	3.45		(0%-10%)		02/20/15	17:50
Zinc	U	ND	DU	ND	ug/L	N/A		(0%-10%)		02/20/15	14:19
Metals Analysis-ICP											
Batch	1453628										
QC1203253450	LCS										
Calcium	5000			5040	ug/L		101	(80%-120%)	HSC	02/13/15	14:33
Iron	5000			5550	ug/L		111	(80%-120%)			
Magnesium	5000			5150	ug/L		103	(80%-120%)			
Potassium	5000			5240	ug/L		105	(80%-120%)			
Sodium	5000			5060	ug/L		101	(80%-120%)	JWJ	02/20/15	14:19
Vanadium	500			534	ug/L		107	(80%-120%)	HSC	02/13/15	14:33
QC1203253449	MB										
Calcium			U	ND	ug/L					02/13/15	14:29
Iron			U	ND	ug/L						
Magnesium			U	ND	ug/L						
Potassium			U	ND	ug/L						
Sodium			U	ND	ug/L				JWJ	02/20/15	14:16
Vanadium			U	ND	ug/L				HSC	02/13/15	14:29
QC1203253451	365929003	MS									
Calcium	5000	74200		81100	ug/L		N/A	(75%-125%)		02/13/15	14:39

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1453628										
Iron	5000	208		5780	ug/L		111	(75%-125%)			
Magnesium	5000	21100		26700	ug/L		N/A	(75%-125%)	HSC	02/13/15	14:39
Potassium	5000	5940		11400	ug/L		109	(75%-125%)			
Sodium	5000	32900		38800	ug/L		N/A	(75%-125%)	JWJ	02/20/15	14:25
Vanadium	500	8.04		551	ug/L		109	(75%-125%)	HSC	02/13/15	14:39
QC1203253452 365929003 MSD											
Calcium	5000	74200		81900	ug/L	0.960	N/A	(0%-20%)		02/13/15	14:41
Iron	5000	208		5780	ug/L	0.111	112	(0%-20%)			
Magnesium	5000	21100		26900	ug/L	0.762	N/A	(0%-20%)			
Potassium	5000	5940		11400	ug/L	0.202	108	(0%-20%)			
Sodium	5000	32900		38900	ug/L	0.317	N/A	(0%-20%)	JWJ	02/20/15	14:27
Vanadium	500	8.04		550	ug/L	0.147	108	(0%-20%)	HSC	02/13/15	14:41
QC1203253453 365929003 SDILT											
Calcium		74200	D	14400	ug/L	2.97		(0%-10%)		02/13/15	14:44
Iron		208	D	44.5	ug/L	7.03		(0%-10%)			
Magnesium		21100	D	4150	ug/L	1.66		(0%-10%)			
Potassium		5940	D	1170	ug/L	1.48		(0%-10%)			
Sodium		32900	D	6710	ug/L	2.02		(0%-10%)	JWJ	02/20/15	15:04
Vanadium		8.04	D	1.70	ug/L	5.62		(0%-10%)	HSC	02/13/15	14:44

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
		concentration and/or decision level for associated samples.									
D		Results are reported from a diluted aliquot of sample.									
E		Reported value is estimated due to interferences. See comment in narrative.									
M		Duplicate precision not met.									
N		Spike Sample recovery is outside control limits.									
S		Reported value determined by the Method of Standard Additions (MSA)									
U		Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.									
W		Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.									
X		Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y		Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Z		Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^a The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL365929
Work Order #: 365929**

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1453650 **Method:** 9056_ANIONS_IC: COMMON

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9056A:

Sample ID	Client ID
365929001	B2YYW7
1203253519	Method Blank (MB)
1203253520	Laboratory Control Sample (LCS)
1203253521	365929001(B2YYW7) Sample Duplicate (DUP)
1203253522	365929001(B2YYW7) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample365929001 (B2YYW7) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recoveries for this sample set were within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

Sample was initially analyzed within holding; however, the PS failed and the holding time had expired prior to reanalysis of sample. 1203253522 (B2YYW7PS).

Sample Dilutions

Samples 1203253521 (B2YYW7DUP), 1203253522 (B2YYW7PS) and 365929001 (B2YYW7) were diluted because target analyte concentrations exceeded the calibration range. Samples 1203253521 (B2YYW7DUP), 1203253522 (B2YYW7PS) and 365929001 (B2YYW7) were diluted based on historical data.

Analyte	365929
	001
Sulfate	10X

Sample Re-analysis

Sample1203253522 (B2YYW7PS) was reanalyzed due to PS failure. The reanalysis data was reported.

Sample1203253522 (B2YYW7PS) was re-analyzed to verify the result.

Miscellaneous Information

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1377752. 1203253522 (B2YYW7PS).

Manual Integrations

Samples 1203253521 (B2YYW7DUP) and 365929001 (B2YYW7) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1454936 **Method:** 2320_ALKALINITY: GW 01

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SM 2320B:

Sample ID	Client ID
365929002	B2YYW9
1203257029	Method Blank (MB)
1203257031	Laboratory Control Sample (LCS)
1203257033	365929002(B2YYW9) Sample Duplicate (DUP)
1203257035	365929002(B2YYW9) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 365929002 (B2YYW9) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

Additional Comments

50mL of sample was used due to limited quantity. 1203257033 (B2YYW9DUP), 1203257035 (B2YYW9MS) and 365929002 (B2YYW9).

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

February 24, 2015

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL365929 GEL Work Order: 365929


The Qualifiers in this report are defined as follows:

- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- D Results are reported from a diluted aliquot of sample.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Thomas Lewis

Date: 23 FEB 2015

Title: Data Validator

Sample Data Summary

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 23, 2015

Client Sample ID: B2YYW7
Sample ID: 365929001
Matrix: WATER
Collect Date: 27-JAN-15 12:46
Receive Date: 28-JAN-15
Collector: Client

Project: CPRC0S15001
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
<i>9056_ANIONS_IC: COMMON "As Received"</i>											
Chloride		4420	+/-149	67.0	200	ug/L	1	RXB5	01/29/15	0216	1453650 1
16887-00-6											
Fluoride	B	231	+/-13.4	33.0	500	ug/L	1				
16984-48-8											
Nitrate-N		1460	+/-50.0	33.0	250	ug/L	1				
14797-55-8											
Nitrite-N	U	0.00	+/-12.7	38.0	250	ug/L	1				
14797-65-0											
Sulfate	D	25400	+/-955	1330	4000	ug/L	10	RXB5	01/29/15	0420	1453650 2
14808-79-8											

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF S15-001**

Report Date: February 23, 2015

Client Sample ID:	B2YYW9	Project:	CPRC0S15001
Sample ID:	365929002	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	27-JAN-15 12:46		
Receive Date:	28-JAN-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis											
<i>2320_ALKALINITY: GW 01 "As Received"</i>											
Alkalinity, Total as CaCO3		75800	1450	2000	ug/L		PXO1	02/04/15	1128	1454936	1
ALKALINITY											
Bicarbonate alkalinity (CaCO3)		75800	1450	2000	ug/L						
71-52-3											
Carbonate alkalinity (CaCO3)	U	0.00	1450	2000	ug/L						
CO3ALKALINITY											
Hydroxide alkalinity as CaCO3	U	0.00	1450	2000	ug/L						
84625-61-6											

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SM 2320B	

Quality Control Summary

February 24, 2015
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QC Summary

Report Date: February 23, 2015

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CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington
Mr. Scot Fitzgerald

Contact:

Workorder: 365929

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1453650										
QC1203253521	365929001	DUP									
Chloride		4420		4430	ug/L	0.0226		(0%-20%)	RXB5	01/29/15	02:47
Fluoride	B	231	B	227	ug/L	1.88	^	(+/-500)			
Nitrate-N		1460		1460	ug/L	0.411		(0%-20%)			
Nitrite-N	U	38.0	U	38.0	ug/L	N/A					
Sulfate	D	25400	D	25600	ug/L	0.793		(0%-20%)		01/29/15	04:51
QC1203253520	LCS										
Chloride	5000			4650	ug/L		93	(90%-110%)		01/29/15	06:55
Fluoride	2500			2400	ug/L		96.1	(90%-110%)			
Nitrate-N	2500			2400	ug/L		96.2	(90%-110%)			
Nitrite-N	2500			2430	ug/L		97.3	(90%-110%)			
Sulfate	10000			9780	ug/L		97.8	(90%-110%)			
QC1203253519	MB										
Chloride			U	67.0	ug/L					01/29/15	06:24
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L						
Sulfate			U	133	ug/L						
QC1203253522	365929001	PS									
Chloride	5.00	4.42		9.81	mg/L		108	(90%-110%)		01/30/15	11:43
Fluoride	2.50	B	0.231	2.66	mg/L		97.3	(90%-110%)			
Nitrate-N	2.50	1.46	X	4.05	mg/L		104	(90%-110%)			

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QC Summary

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Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography												
Batch	1453650											
Nitrite-N	2.50	U	0.00	X	2.53	mg/L		101	(90%-110%)			
Sulfate	10.0	D	2.54	D	12.9	mg/L		103	(90%-110%)	RXB5	01/29/15	05:22

Titration and Ion Analysis

Batch	1454936											
QC1203257033 365929002 DUP												
Alkalinity, Total as CaCO3			75800		75800	ug/L	0.00		(0%-20%)	PXO1	02/04/15	11:30
Bicarbonate alkalinity (CaCO3)			75800		75800	ug/L	0.00		(0%-20%)			
Carbonate alkalinity (CaCO3)		U	1450	U	1450	ug/L	N/A					
Hydroxide alkalinity as CaCO3		U	1450	U	1450	ug/L	N/A					
QC1203257031 LCS												
Alkalinity, Total as CaCO3	50000				47600	ug/L		95.3	(90%-110%)		02/04/15	10:39
QC1203257029 MB												
Alkalinity, Total as CaCO3				U	725	ug/L					02/04/15	10:39
Bicarbonate alkalinity (CaCO3)				U	725	ug/L						
Carbonate alkalinity (CaCO3)				U	725	ug/L						
Hydroxide alkalinity as CaCO3				U	725	ug/L						
QC1203257035 365929002 MS												
Alkalinity, Total as CaCO3	100000		75800		168000	ug/L		92.3	(80%-120%)		02/04/15	11:31

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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Workorder: 365929

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

February 24, 2015

DATA EXCEPTION REPORT			
Mo.Day Yr. 31-JAN-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Liquid	Client Code: CPRC
Batch ID: 1453650	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 365929(GEL365929),365932(GEL365932) Application Issues: Sample Analyzed out of Holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample Analyzed out of Holding: QC 1203253522PS		1. Sample was initially analyzed within holding; however, the PS failed and the holding time had expired prior to reanalysis of sample. 1203253522 (B2YYW7PS).	

Originator's Name:
Rachael Bell 12-FEB-15

Data Validator/Group Leader:
Thomas Lewis 23-FEB-15